

Appl. No. 10/708,750
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AMENDMENTS TO THE DRAWINGS

Replacement drawing sheets 2/4 and 4/4 (Figures 2 and 4) are submitted herewith. Figures 2 and 4 have been corrected to show proper hatching as suggested by the Examiner.

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REMARKS

Claims 8, 10, 16, 19, 26, and 28 are amended and claim 53 is cancelled. Claims 1-52 and 54-59 are pending in the application.

Claims 1, 3-10, 13-17, and 20-23 stand rejected as anticipated by *Boyd '712*; claims 11 and 12 stand rejected as obvious in view of *Boyd '712* and *Boyd '879*; claims 24-59 are allowed; and claims 2, 18, and 19 are indicated as containing allowable subject matter. Further examination of the application, as amended, and reconsideration of the rejections are respectfully requested.

Claims 8, 16, 19-21, 26 and 53 were objected to because of informalities. Claim 8 has been amended to remove the unnecessary period. Claim 10 has been amended to correct the typographical error "communication" to read "communications". Claim 16 has been amended to correct the antecedent basis of "the top entry sub" to read "an entry sub". This amendment to claim 16 corrects the objections to claims 20 and 21. Claim 16 has also been amended to correct "the said articulated" to read "said articulated" as indicated by the Examiner. Claim 26 has been amended as the Examiner has suggested to clarify the reference to the proper joint. Claim 28 has been amended to add the missing term "and" between

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elements. Claim 53 has been cancelled as being a duplicate of claim 52. No new matter is presented in the amendments.

Figures 2 and 4 were objected to under 37 CFR 1.184(h)(3). Figures 2 and 4 are corrected to add hatching. Corrected drawings are attached.

By way of background, Applicant's invention provides a method and apparatus to allow tools disposed on a conduit to enter the bore of a drillstring. These tools are introduced into the body of the entry sub through the entry port on the body of the articulated body. More specifically, tools can enter the bore through the use of one or more articulated joints or articulated knuckle joints on the entry sub. Articulated knuckle joints are discussed in the specification at paragraph [0027], for example. The Boyd '712 apparatus is a swivel which is only designed to permit axial rotation of the drill string below the swivel upon disengagement of the locking teeth and to restrict axial rotation when the tool is locked. There is no suggestion that Boyd '712 teaches minimizing bending or lateral movements on the entry sub device.

Regarding independent claims 1 and 15 and amended claim 16, *Boyd '712* does not suggest an articulated knuckle joint to allow deflection. As noted in Applicant's specification at paragraph [0027], a knuckle joint can be "preferably constructed as ball-and-socket joints but any flexible joint

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(including, but not limited to, a U-joint design) known to one skilled in the art may be employed.” In sharp contrast, *Boyd* ‘712 only teaches a mechanical locking in-line swivel apparatus. See *Boyd* ‘712, Col. 2, lines 36-40 (“2/36-40”)

A swivel is defined as “a link, pivot, or other fastening so designed that it permits the free *turning* of attached parts” (www.dictionary.com). At 5/56-59, *Boyd* ‘712 teaches a swivel that allows *rotation* of “the portion of the drill string below the upper portion of the apparatus without having to *rotate* the upper portion of the apparatus and anything above it at all.” As further illustrated in Figures 2 and 3, *Boyd* ‘712 teaches the horizontal *axial rotation* of one swivel portion relative to the other, but does not teach a *flexible* joint. The swivel in *Boyd* ‘712 is not the equivalent of an articulated knuckle joint since it is not flexible. Furthermore, *Boyd* ‘712 does not teach a “joint to allow deflection of the main body relative to a... connection to the drillstring” as in Applicant’s claim 1 and 15. Again, *Boyd* ‘712 only teaches coaxial rotation of one portion relative to the other, not the deflection of either portion by an articulated knuckle joint therebetween.

Furthermore, claims 1 and 15 recite a body having both an upper connection to the drillstring *and* an entry port. *Boyd* ‘712 discloses an upper connection that includes a connection to the drillstring, but not an entry port

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as recited in claims 1 and 15 as the Examiner suggests. The wireline entry point 20 in Fig. 1 of the *Boyd '712* apparatus is quite separate and distinct from the swivel 10. Claims 1 and 15 of the present application recite a body having both a communications pathway extending from the entry port to the lower connection, *with* the main body configured to allow fluid communication between the upper and lower connection. See also Applicant's paragraph [0007].

Additionally, Applicant's claims 1 and 15 and amended claim 16 have been obvious in view of *Boyd '712*. *Boyd '712* discloses a mechanical swivel apparatus mounted below a separate angulated side entry sub. The angulated side entry sub does not teach an articulated knuckle joint and, as demonstrated above, a swivel is not the equivalent of an articulated knuckle joint. *Boyd '712* clearly teaches away from Applicant's invention, relying on a non-jointed side entry sub far removed from the swivel 10, Fig. 1, whose angle of inclination can limit the entry of tools into the bore of the drillstring.

Further, *Boyd '712* does not teach or suggest any solution to the problem of tool entry, but only to the problem of rotation of an entry sub while a wireline is present. At 1/47-48, *Boyd '712* discloses a mechanical locking swivel apparatus "to reorient the drill bit while a wireline is

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downhole.” In sharp contrast, Applicant’s invention recognizes and solves the tool entry problem by using an articulated knuckle joint to allow a tool entry passage (40 in Figure 2) and a lower pipe section (20 in Figure 2) to line up in a substantially coaxial arrangement. See paragraph [0033]. *Boyd* ‘712 wholly fails to even suggest, when properly understood, the type of entry sub Applicant claims and thus cannot make obvious Applicant’s claimed invention.

As to claim 10, element 30 in Figure 2 of *Boyd* ‘712 is “threads”, not a receiving profile as the Examiner suggests. See 3/46. Applicant’s amended paragraph [0026] states the receiving “profile 48 may be of any type and design to either prevent abrasion of passages 40 or 44 resulting from extended manipulation of conduit 5 therethrough.” Even if the swivel of *Boyd* ‘712 was used as a communications pathway, the threads are not the equivalent of a receiving profile as threads are not typically subject to or designed to prevent abrasion. There is no suggestion that the threads would function as a receiving profile when slidingly contacted by a conduit. Furthermore, it would not have been obvious to use the threads of *Boyd* ‘712 as a receiving profile because the swivel (when in use) is connected to a drillstring, as stated in the specification at 5/56-59, and thus the threads would contact the corresponding drillstring threads and would not be

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exposed to abrasion by a conduit passed therethrough. To be meaningful, the receiving profile of the present invention must be found to prevent abrasion from tools and the communication conduit being fed through the body of the articulated drill string entry apparatus. This function is clearly absent in the threads 30 of *Boyd '712*.

As to claim 20, *Boyd '712* teaches a side entry sub, not a top entry sub as the Examiner suggests. *Boyd '712* side entry sub apparatus 16 of Figure 1 provides the communications port. See 3/21. The swivel 10 in Fig. 1 of *Boyd '712* is not part of and is physically separated from the side entry sub 16. The swivel apparatus of Figure 2 is not a top entry sub as there is no *separate* top entry port as indicated by the term "entry sub", only an upper and a lower connection to a drill string. See Applicant's paragraph [0007]. Nor would it have been obvious to use the swivel as a top entry sub. With no separate entry port, one of the drillstring connections to the swivel would have to be disconnected to allow tools to be inserted therein, which fact clearly teaches away from use as the *Boyd '712* device as an entry sub due to the loss in drilling pressure which would occur during disconnection. See Applicant's paragraph [0010].

Boyd '879 fails to bridge the gap from *Boyd '712* to Applicant's invention of claims 11 and 12. Neither reference discloses an articulated

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knuckle joint. Furthermore, as stated above in reference to claim 10, element 30 of *Boyd* '712 is a threaded connection and not a receiving profile as suggested. The hardened sleeve of *Boyd* '879 (making up the "receiving profile") is in sub 36 as shown in Fig. 1 of *Boyd* '879, not in the tubular threaded connection 30 of said drawing. The Examiner suggests including the wear-resistant material or wear sleeve of *Boyd* '879 to cover the threads of *Boyd* '712 to teach Applicant's claims 11 and 12. Even if this could be accomplished by a person having ordinary skill in the art, wear-resistant material so configured would only protect the unconnected threads from wear, however *Boyd* '712 teaches both ends of its threaded swivel are connected to drillpipe during use. See 5/33-51.

The threaded connection of *Boyd* '712 cannot function as a receiving profile used to prevent abrasion caused by a conduit running therethrough. The resulting combination cannot teach or even suggest the claimed invention of claims 11 and 12. It would not have been obvious to combine *Boyd* '879 and *Boyd* '712 to create Applicant's invention. All dependent claims are allowable for at least the same reasons, together with specific reasons shown herein. *Boyd* '712 and '879 are inapposite as prior art to each of the independent claims of the pending application, when properly

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interpreted. Applicant has traversed all rejections and objections and believes the application and claims are in condition for allowance.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. If any issues remain that are appropriate for resolution, please contact undersigned counsel.

Respectfully submitted,



DBD/st

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